

REPORT DOCUMENTATION PAGE			Form Approved OMB NO. 0704-0188
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1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED	
		Final Report	31 Mar 05-30 Mar 01
4. TITLE AND SUBTITLE		5. FUNDING NUMBERS	
Identification of Chemical Residues . . .		DAAD19-00-1-0042	
6. AUTHOR(S)			
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7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(ES)		8. PERFORMING ORGANIZATION REPORT NUMBER	
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9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
U.S. Army Research Office P.O. Box 12211 Research Triangle Park, NC 27709-2211		ARO 40836.1-CH-R1P	
11. SUPPLEMENTARY NOTES The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other documentation.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited.		12b. DISTRIBUTION CODE A	
13. ABSTRACT (Maximum 200 words) Instrumentation was purchased that helps characterize the chemical structures and chemical reactions that occur when nanocrystalline metal oxides carry out destructive adsorption of chemical agents mimics. The residues (adducts) are characterized and the gases given off identified.			
14. SUBJECT TERMS Nanoscale metal oxides, chemical agents, mimics, instrumentation			15. NUMBER OF PAGES 3
			16. PRICE CODE
17. SECURITY CLASSIFICATION OR REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL

DAAD19-00-1-0042

“Identification of Chemical Agents (Mimics) Residues After
Destructive Adsorption Using TPD and UV-vis-IR and Raman”

April 2001
U.S. Army Research Office

To: Army Research Office, ATTN
AMSRL-RO-RI
P.O. Box 12211
Research Triangle Park, NC 27709-2211

From: Kansas State University
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Manhattan, KS 66506

Technical Summary

Purchase of Instrumentation: DOD funds expended (shown) that were partially matched by KSU funds

- (1) Quantachrome Pore Size Analyzer. (\$4,290)
This instrument is used to determine, by mercury fillings of pores, pore volume, and pore size distributions of nanocrystalline materials produced in our research laboratory.
- (2) GOW MAC Gas Chromatograph (\$4,216)
This instrument is used to analyze gases evolved in the surface chemistry of nanoparticles interacting with toxic substances, including chemical warfare agent mimics.
- (3) Spectral Instruments (\$7,679)
The UV-vis spectrometer is used to characterize nanoparticle – adsorbate bonding
- (4) Shimadzu TGC-GCMS (\$64,819)
This combined instrumentation is used to analyze gases evolved when nanoparticle –adsorbate adducts are heated. This helps identify the type of bonding in the adduct, and how it decomposes on heating.
- (5) Nicolet FT-IR and Raman (\$48,996)
This instrument is used to characterize new nanoparticle formulations, and to characterize the chemical bonding in nanoparticle-adsorbate adducts. This is especially important when we use chemical warfare agent mimics as the adsorbate.